Killer Hardware Tips

Too Cool To Follow Rules

IF YOU'RE A USER WHO CAN'T LEAVE THINGS ALONE IF THERE'S A CHANCE YOU CAN MAKE THEM BETTER, EVEN IF IT MEANS BUCKING THE NORM, READ ON.

We have some tips and tricks that might help your system run cooler and faster.

Flat Is Out, Round Is In

If the inside of your PC's case is a rat's nest of ribbon cables stringing hither and yon, tame the mess by replacing the ribbons with round cables. You'll gain a more organized look, plus the round cables may improve airflow and keep things cooler.

You can buy ready-made, molded round cables from vendors—including Cables To Go (www.cablestogo.com) and 3Dcool.com (www.3dcool.com). But at $13 or more each, rounded cables cost more than standard ribbon cables. If you have more time than money, make your own round cables. "Cable rounding" involves carefully separating the wires in a ribbon cable and bundling them in a rounded shape with conduit or tie wraps.

"Rounded cables are much easier to work with and allow for cable positioning that just isn't possible with the flat ribbon type," says Scott Madison, a computer telephony engineer at MCI WorldCom and the author of a guide to cable rounding available at www.sysopt.com/articles/cabround.

How much cooler your PC will be by using rounded cables depends on many factors, including the number and CFM rating of the case fans, the size and shape of the case, and the number of cables installed. "Rounding the cables decreases the overall surface area of the cable that is in contact with the air movement, thereby decreasing the amount of restriction on air circulation," says Madison.

In Madison's tests, full-sized tower cases show a slight improvement in case and CPU temperature (a decrease of one to two degrees Celsius). In mini-tower systems with more restricted airflow, the difference is more dramatic (three to six degrees Celsius). "While neither of these temperature decreases sound particularly earth-shattering, to the system enthusiast or overclocker, these are significant," says Madison.

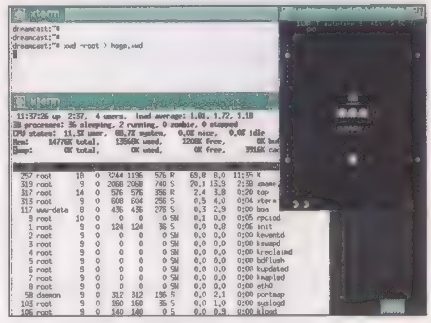
Madison says rounding out ribbon cables isn't particularly difficult but it is easy to ruin a cable in the process. "Performance-wise, if done correctly, there should be no difference between the homemade rounded cables and those that can be purchased from a vendor," he says.

Long Live Dreamcast!

So what if Sega no longer supports Dreamcast, a bitter loser in the game console wars. So what that you're bored stiff with Crazy Taxi and Sonic Adventure. Give your dusty Dreamcast a new life by running Linux on it.

Hackers at the LinuxDC Project (http://sourceforge.net/projects/linuxdc) and the GNU/Linux On SEGA Dreamcast Project (www.m17n.org/linux-sh/dreamcast) have ported the Linux kernel, GNU utilities, and graphical window managers to the Dreamcast. With Linux running on your console, you can send e-mail, telnet in and out, and even use MAME to play emulated arcade games.

You can get a taste of Dreamcast under Linux without much fuss. Adrian O'Grady offers a beginner's guide (www.fivemouse.com/dclinux.html) to installing it that includes a ready-made disc image. Use the disc image and version of Disc Juggler (www.padus.com) to burn a Linux boot CD-ROM and pop it into the console. This is a great starter kit, but if you want more control of the kernel and applications you install, cobble together your own CD. This involves creating your own boot loader and following the specs to make a Dreamcast-bootable CD-R.



You can still get mileage out of your Dreamcast by burning your own Linux or NetBSD disc and running Unix applications, GNU utilities, and MAME.

Writing your own programs is trickier, involving cross-compiling code from a PC to the Dreamcast's Hitachi SH4 CPU. A technical guide to building Linux on a Dreamcast and porting code is available at www.linuxdevices.com/articles/AT7466555948.html.

"The Dreamcast is at a very interesting stage," says Steve Schramm, a graphic artist and Dreamcast hacker. "It's technically dead. But the hardware is cheap, and peripherals are mostly cheap and will only get cheaper as things hit close-out status."

Besides a Dreamcast console, you'll need a Sega keyboard or an adapter that converts

a PS/2 keyboard to the Dreamcast's I/O port. You'll also want a mouse that uses the X Window System. If you want to hook the console to your LAN for Internet access, you'll also need the Dreamcast Broadband Adapter. The Broadband Adapter is the exception to the "cheap closeout" rule. The adapter is in short supply and sells for $150 or more on eBay.

If Linux isn't what you're looking for, another group is pitching the NetBSD operating system to Dreamcast. For more information, check out www.netbsd.org/Ports/dreamcast.

GeForce Is With You

What do you do if life has blessed you with a snazzy video card? Make it even better, of course. The NVIDIA GeForce series is among the most popular video cards among gamers. Not content to leave well enough alone, NVIDIA users have devised ways to tweak their beloved cards and make graphics look better in the process.

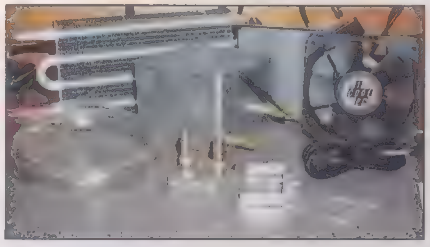
Perhaps the quickest way to enhance your video is to upgrade to the latest video drivers. "The single best method for increasing GeForce performance is found with the NVIDIA Detonator XP reference drivers. These enhanced drivers offer substantial increases in both performance and compatibility across the entire range of GeForce products," says Robert Richmond, a technical journalist and NVIDIA hacker who claims to have close ties to underground sources at NVIDIA.

Chipset manufacturers create reference drivers as a generic solution. "Most video card manufacturers follow the base NVIDIA reference design, thus the reference drivers are usually the best solution unless a vendor is offering a card with some exotic option like video input support," says Richmond.

The latest official drivers are available at www.nvidia.com. Adventurous users can push the envelope with unofficial drivers. Other sites often offer later release versions leaked from testing channels. Reactor Critical (www.reactorcritical.com) and 3DChipset (www.3dchipset.com) have details about both types of driver versions.

For a whole new level of control, download GeForce Tweaker available at www.guru3d.com/geforcetweakutility. This free utility will let you fine-tune the workings of the card, including Direct3D and OpenGL settings, and overclock the card. You can also use Tweaker to enable beta features such as hardware-accelerated antialiasing.

How your motherboard interacts with the video card is also essential to performance. Set your system's BIOS settings for optimal interaction with the NVIDIA card. For instance, maximize the AGP transfer rate and enable both AGP sidebanding and AGP fastwrites. Also disable the video buffer caching and shadowing functions. For other BIOS suggestions, see the article "Quick, Fast & In A Hurry" in the December issue of *Computer Power User*.



Water-cooling kits, such as these (image courtesy of 1COOLPC.com), can cool down your system's CPU while increasing performance.

All Day I Face The Barren Waste Without A Taste Of Water

Even a newbie knows computers and water don't mix. So pumping water around the inside of a PC case may sound foolish, but that's exactly what some hard-core overclockers do to keep their systems cool.

With a water-cooling system, CPU heat dissipates to flowing water rather than into the air. Water is 30 times more thermally conductive. Unlike with a standard heat sink, a water-cooled CPU's temperature is virtually constant, no matter the system load. Thus, water-cooled CPUs can often be overclocked farther than their air-cooled counterparts.

A water pump pulls water from a reservoir, pushing it into a waterblock attached to the CPU. Inside the waterblock is a maze of channels. The water absorbs heat as it flows through the channels. The water then flows to a radiator that dissipates heat to the outside air. After cooling, the liquid goes back into the reservoir. The reservoir and pump can be housed inside a large tower case or be external fixtures. You can build a water-cooling system from parts scraped together at an aquarium store or junkyard or buy a ready-to-install kit.

"The main advantage to building your own water-cooling solution would be to save money. Many parts in the kits are rebadged auto parts, pond pumps, or fish tank parts often sold at a 100% markup. A buyer paying attention can save a good amount of money," says John Collard, a writer for HardwareOC (www.hardwareoc.com). "On the flip side, a prebuilt kit offers all the components in one easy-to-assemble package. All parts have been tested to work together, and it takes the risk out of buying parts that may be unsuitable."

Careful installation is essential. You must also assure an adequate water supply, and hoses need to be checked to minimize potential leakage. "The key to successful and safe water cooling is attention to detail. Pay attention to every connection. Make sure there are no kinked hoses and the waterblock is seated flat on the CPU die. Run the system for several hours to check for leaks before you turn the power on to the motherboard," says Collard.

For more information about water-cooling systems, check out www.tomshardware.com/cpu/01q2/010528 and also www.hardwareoc.com/waterbudget1.php. Water-cooling kits typically cost $125 to $200 and are available from such vendors as Swiftech (www.swiftnets.com) and 1COOLPC (www.1coolpc.com). CPU

by Kevin Savetz

Infinite Loop

Long On Data

If you stretch out the spiral track of a single-sided, single-layered DVD-ROM, it will measure 7.4 miles long, according to DVD Forum Secretariat Hideyuki Irie.